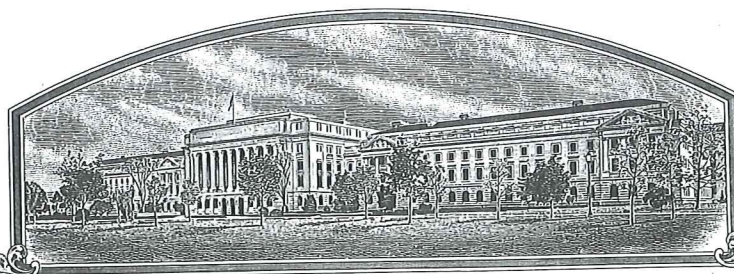


No.

200800241



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

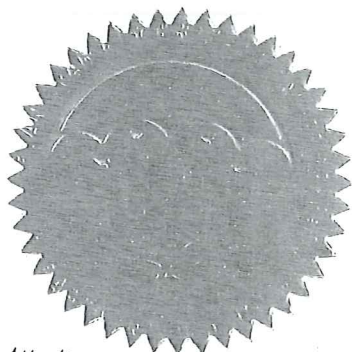
Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of LAW in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and Whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the LAW.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable basic seed of the variety in a public repository as provided by LAW, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety therefrom, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'PHPNN'



Attest:

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this eighteenth day of January, in the year two thousand and thirteen.

Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

Secretary of Agriculture

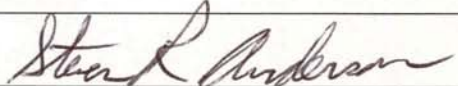


U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE  
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER <b>Pioneer Hi-Bred International, Inc.</b>		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME		3. VARIETY NAME <b>PHPNN</b>	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) <b>7301 NW 62<sup>nd</sup> Avenue Johnston, IA 50131-0085</b>		5. TELEPHONE (include area code) <b>(515) 270-4051</b>		FOR OFFICIAL USE ONLY	
		6. FAX (include area code) <b>(515) 253-2125</b>		PVPO NUMBER <b>#200800241</b>	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) <b>Corporation</b>		8. IF INCORPORATED, GIVE STATE OF INCORPORATION <b>Iowa</b>		FILING DATE <b>May 2, 2008</b>	
9. DATE OF INCORPORATION <b>March 5, 1999</b>		10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) <b>Steven R. Anderson Research and Product Development P.O. Box 85 1004 Johnston, IA 50131-0085 -1004</b>		FILING AND EXAMINATION FEES: \$ <b>4382.00</b> DATE <b>5/2/08</b> CERTIFICATION FEE: \$ DATE	
11. TELEPHONE (Include area code) <b>(515) 270-4051</b>		12. FAX (Include area code) <b>2288</b> <b>(515) 253-2125</b>		13. E-MAIL <b>steven.anderson@pioneer.com</b>	
14. CROP KIND (Common Name) <b>Corn</b>		16. FAMILY NAME (Botanical) <b>Gramineae</b>		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
15. GENUS AND SPECIES NAME OF CROP <b>Zea Mays</b>		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Exhibit F. Declaration Regarding Deposit g. <input checked="" type="checkbox"/> Voucher Sample (3,000 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) h. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23) <input type="checkbox"/> UNDECIDED			
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED			
		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)			
24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)					
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER		SIGNATURE OF OWNER 			
NAME (Please print or type)		NAME (Please print or type) <b>Steven R. Anderson</b>			
CAPACITY OR TITLE		CAPACITY OR TITLE <b>Research Scientist</b>			
DATE		DATE <b>4-27-2008</b>			



**GENERAL INSTRUCTIONS:** To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filing fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). **NEW:** With the application for a seed reproduced variety **or by direct deposit soon after filing**, the applicant must provide at least 3,000 viable untreated seeds of the variety *per se*, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to **reproduce** the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

**NOTES:** It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

**Plant Variety Protection Office**  
**Telephone:** (301) 504-5518 **FAX:** (301) 504-5291  
**General E-mail:** PVPOmail@usda.gov  
**Homepage:** <http://www.ams.usda.gov/science/pvpo/PVPIndex.htm>

#### **SPECIFIC INSTRUCTIONS:**

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and **provide evidence** that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. <http://www.ams.usda.gov/lsg/seed.htm>.

#### **ITEM**

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;  
 (2) the details of subsequent stages of selection and multiplication;  
 (3) evidence of uniformity and stability; and  
 (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;  
 (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and  
 (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

**22. CONTINUED FROM FRONT** (Please provide a statement as to the limitation and sequence of generations that may be certified.)

**23. CONTINUED FROM FRONT** (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

**24. CONTINUED FROM FRONT** (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



**Exhibit A: Origin and Breeding History for PHPNN**

Pedigree: PH1GD/PH76T)X6212121X

Pioneer Line PHPNN, *Zea mays L.*, a yellow endosperm corn inbred, was developed by Pioneer Hi-Bred International, Inc. from the single cross hybrid PH1GD (PVP Certificate No. 200000223) X PH76T (PVP Certificate No. 200200182) using the pedigree method of plant breeding. Varieties PH1GD and PH76T are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Selfing was practiced from the above hybrid for 9 generations using pedigree selection. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Moorhead, Minnesota as well as other Pioneer research locations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations again made for uniformity.

Variety PHPNN has shown uniformity and stability for all traits as described in Exhibit C - "Objective Description of Variety." It has been self-pollinated and ear-rowed 8 generations with careful attention paid to selection criteria and uniformity of plant type to assure genetically homozygous and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity and stability, and for 3 generations during the final stages of inbred development and seed multiplication. Very high standards for genetic purity have been established morphologically using field observations and using sound lab molecular marker methodology.

No variant traits have been observed or are expected in PHPNN.

The criteria used in the selection of PHPNN were yield, both per se and in hybrid combinations. Late season plant health, grain quality, and stalk lodging resistance, were important criteria considered during selection. Other selection criteria include: ability to germinate in adverse conditions, disease and insect resistance, pollen yield and tassel size.

**Exhibit A: Developmental History for PHPNN**

Pedigree Grown Year	Inbreeding Level of Pedigree Grown
PH1GD 2000	F0
PH76T 2000	F0
PH1GD/PH76T 2000	F1
PH1GD/PH76T)X 2001	F2
PH1GD/PH76T)X6 2002	F3
PH1GD/PH76T)X62 2003	F4
PH1GD/PH76T)X621 2003	F5
PH1GD/PH76T)X6212 2004	F6
PH1GD/PH76T)X62121 2004	F7
PH1GD/PH76T)X621212 2005	F8
PH1GD/PH76T)X6212121 2005	F9
PH1GD/PH76T)X6212121X	F10 (SEED)

PHPNN was selfed and ear-rowed from F2 through F9 generation.

Uniformity and stability were established from F7 through F9 generation and beyond when seed supplies were increased.

**Exhibit B: Novelty Statement**

Variety PHPNN mostly resembles Pioneer Hi-Bred International, Inc. proprietary inbred line PH1GD (PVP Certificate No. 200000223). Table 1 shows two sample t-tests on data collected primarily in Johnston and Dallas Center, Iowa in 2007. The traits collectively show measurable differences between the two varieties.

Variety PHPNN has a greater leaf angle (36.8 degrees vs 25.6 degrees) than variety PH1GD (Table 1).

Variety PHPNN has fewer leaves above top ear (4.6 vs 5.8) than variety PH1GD (Table 1).



## Exhibit B - Addendum

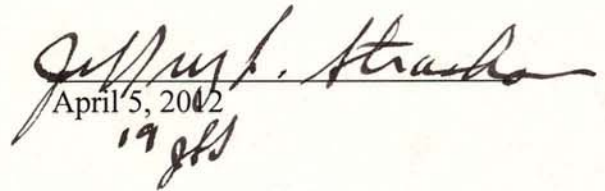
'PHPNN' is most similar to 'PH1GD'.

The time from plant emergence to 50% of plants in silk for 'PHPNN' is 49 days or 1026.5 heat units and for 'PH1GD' is 68 days or 1200.4 heat units.

The time from plant emergence to 50% of plants pollinating for 'PHPNN' is 49 days or 1026.5 heat units and for 'PH1GD' is 67 days or 1188.4 heat units.

'PHPNN' glume color is red (Munsell 5R 4/6) and 'PH1GD' glume color is light green (Munsell 5GY 6/6).

The examiner added the information the applicant supplied in the exhibit C for silk and pollen maturity data and glume color differences as additional distinguishing features for 'PHPNN' versus 'PH1GD'. The statistics presented for number of leaves above the top ear showed extremely close similarities that may or may not have been within the tolerances of the measuring equipment and techniques used by the applicant.

  
April 5, 2012  
19 gfs

# Exhibit B: Novelty Statement Table

Table 1: Data from Johnston and Dallas Center, Iowa in 2007 presented by trait, across environments, and broken out by environment. Data are supporting evidence for differences between PHPNN and PH1GD. Varieties were grown in two locations that had different environmental conditions. Environments had different planting dates and were in different fields. A two-sample t-test was used to compare differences between means.

## Leaf angle (degrees)

Level	Location	Year	Variety-1	Variety-2	Cnt-1	Cnt-2	Mean-1	Mean-2	Mean_Diff	StDev-1	StDev-2	StErr-1	StErr-2	DF	t-Value	Prob_Pool
1. Over All			PHPNN	PH1GD	30	30	36.8	25.6	11.2	4.997	5.372	0.912	0.981	58	8.4	0.000
2. Year		2007	PHPNN	PH1GD	30	30	36.8	25.6	11.2	4.997	5.372	0.912	0.981	58	8.4	0.000
3. Environ.	DSBNLFRM2		PHPNN	PH1GD	15	15	34.0	21.2	12.7	4.309	2.154	1.113	0.556	28	10.2	0.000
3. Environ.	JHBNDK1620		PHPNN	PH1GD	15	15	39.6	30.0	9.7	3.994	3.780	1.031	0.976	28	6.8	0.000

## Leaf number above top ear

Level	Location	Year	Variety-1	Variety-2	Cnt-1	Cnt-2	Mean-1	Mean-2	Mean_Diff	StDev-1	StDev-2	StErr-1	StErr-2	DF	t-Value	Prob_Pool
1. Over All			PHPNN	PH1GD	30	30	4.6	5.8	-1.2	0.479	0.461	0.088	0.084	58	-9.6	0.000
2. Year		2007	PHPNN	PH1GD	30	30	4.6	5.8	-1.2	0.479	0.461	0.088	0.084	58	-9.6	0.000
3. Environ.	DSBNLFRM2		PHPNN	PH1GD	15	15	4.6	5.6	-1.1	0.507	0.617	0.131	0.159	28	-5.2	0.000
3. Environ.	JHBNDK1620		PHPNN	PH1GD	15	15	4.7	6.0	-1.3	0.458	0.000	0.118	0.000	28	-10.7	0.000



United States Department of Agriculture, Agricultural Marketing Service  
Science and Technology, Plant Variety Protection Office  
National Agricultural Library Building, Room 400  
Beltsville, MD 20705-2351  
OBJECTIVE DESCRIPTION OF VARIETY  
CORN (Zea mays L.)

Name of Applicant(s)	Variety Seed Source	Variety Name or Temporary Designation
Pioneer Hi-Bred International, Inc		PHPNN

Address (Street & No., or R.F.D. No., City, State, Zip Code and Country)	FOR OFFICIAL USE	PVPO Number
7301 NW 62nd Avenue, P.O. Box 85, Johnston, Iowa 50131-0085		#200800241

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a "\*" are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01. Light Green	06. Pale Yellow	11. Pink	16. Pale Purple	21. Buff	26. Other (Describe)
02. Medium Green	07. Yellow	12. Light Red	17. Purple	22. Tan	
03. Dark Green	08. Yellow-Orange	13. Cherry Red	18. Colorless	23. Brown	
04. Very Dark Green	09. Salmon	14. Red	19. White	24. Bronze	
05. Green-Yellow	10. Pink-Orange	15. Red & White	20. White Capped	25. Variegated (Describe)	

STANDARD INBRED CHOICES [Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data]:

Yellow Dent Families:		Yellow Dent (Unrelated):	Sweet Corn:
Family	Members	Co109, ND246	C13, Iowa5125, P39, 2132
B14	CM105, A632, B64, B68	Oh7, T232	
B37	B37, B76, H84	W117, W153R	Popcorn:
B73	N192, A679, B73, Nc268	W182BN	SG1533, 4722, HP301, HP7211
C103	Mo17, Va102, Va35, A682		
Oh43	A619, MS71, H99, Va26	White Dent:	Pipecorn:
WF9	W64A, A554, A654, Pa91	Cl66, H105, Ky228	Mo15W, Mo16W, Mo24W

1. TYPE: (describe intermediate types in "Comments" section)	Standard Inbred Name	A554
2 (1=Sweet, 2=Dent, 3=Flint, 4=Flour, 5=Pop, 6=Ornamental, 7=Pipecorn)	2 Type	

2. REGION WHERE DEVELOPED IN THE U.S.A.:	Standard Seed Source	AMES 19305
2 (1=N.West, 2=N.Central, 3=N.East, 4=S.East, 5=S.Central, 6=S.West, 7=Other)	_ Region	

3. MATURITY (In Region Best Adaptability; show Heat Unit formula in "Comments" section):		
DAYS	HEAT UNITS	DAYS HEAT UNITS
49	1,026.5 From emergence to 50% of plants in silk	54 1,149.3
49	1,026.5 From emergence to 50% of plants in pollen	54 1,148.5
3	50 From 10% to 90% pollen shed	3 64
---	From 50% silk to optimum edible quality	---
---	From 50% silk to harvest at 25% moisture	---

4. PLANT:	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
190.4 cm Plant Height (to tassel tip)	20.85	30	183.5	7.18	30
87.0 cm Ear Height (to base of top ear node)	11.56	30	56.7	5.88	30
14.2 cm Length of Top Ear Internode	1.69	30	13.1	2.15	30
0.0 Average Number of Tillers	0.00	2	0.0	0.00	2
1.2 Average Number of Ears per Stalk	0.02	2	1.1	0.08	2
2 Anthocyanin of Brace Roots: 1=Absent, 2=Faint, 3=Moderate, 4=Dark			2		



5. LEAF	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
<u>7.5</u> cm Width of Ear Node Leaf	<u>0.68</u>	<u>30</u>	<u>8.2</u>	<u>0.63</u>	<u>30</u>
<u>73.4</u> cm Length of Ear Node Leaf	<u>2.11</u>	<u>30</u>	<u>74.5</u>	<u>2.64</u>	<u>30</u>
<u>4.7</u> Number of leaves above top ear	<u>0.48</u>	<u>30</u>	<u>6.6</u>	<u>0.50</u>	<u>30</u>
<u>36.8</u> Degrees Leaf Angle	<u>5.00</u>	<u>30</u>	<u>29.4</u>	<u>5.17</u>	<u>30</u>
(Measure from 2nd leaf above ear at anthesis to stalk above leaf)					
<u>3</u> Leaf Color (Munsell Code) <u>5GY48</u>			<u>3</u> (Munsell Code) <u>5GY44</u>		
<u>1</u> Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)			<u>2</u>		
<u>—</u> Marginal Waves (Rate on scale from 1=none to 9=many)			<u>—</u>		
<u>—</u> Longitudinal Creases (Rate on scale from 1=none to 9=many)			<u>—</u>		

6. TASSEL:	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
<u>4.1</u> Number of Primary Lateral Branches	<u>1.51</u>	<u>30</u>	<u>11.1</u>	<u>1.56</u>	<u>30</u>
<u>32.7</u> Degrees Branch Angle from Central Spike	<u>3.88</u>	<u>30</u>	<u>33.0</u>	<u>9.14</u>	<u>30</u>
<u>53.4</u> cm tassel Length	<u>3.13</u>	<u>30</u>	<u>51.8</u>	<u>3.35</u>	<u>30</u>
(from top leaf collar to tassel tip)					
<u>4</u> Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)			<u>8</u>		
<u>14</u> Anther Color (Munsell Code) <u>7.5RP36</u>			<u>5</u> (Munsell Code) <u>5Y88</u>		
<u>14</u> Glume Color (Munsell Code) <u>5R46</u>			<u>2</u> (Munsell Code) <u>5GY66</u>		
<u>1</u> Bar Glumes (Glume Bands): 1=Absent, 2=Present			<u>1</u>		

7a. EAR (Unhusked Data):	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
<u>2</u> Silk Color (3 days after emergence) (Munsell Code) <u>5GY78</u>			<u>12</u> Munsell Code <u>10RP56</u>		
<u>2</u> Fresh Husk Color (25 days after 50% silking) (Munsell Code) <u>7.5GY56</u>			<u>2</u> Munsell Code <u>5GY78</u>		
<u>19</u> Dry Husk Color (65 days after 50% silking) (Munsell Code) <u>5Y8.52</u>			<u>21</u> Munsell Code <u>2.5Y8.54</u>		
<u>3</u> Position of Ear at Dry Husk Stage: 1=Upright, 2=Horizontal, 3=Pendent			<u>3</u>		
<u>6</u> Husk Tightness (Rate on scale from 1=very loose to 9=very tight)			<u>7</u>		
<u>2</u> Husk Extension (at harvest): 1=Short(ears exposed), 2=Medium (<8cm), 3=Long (8-10cm beyond ear tip), 4=Very Long (>10cm)			<u>2</u>		

7b. EAR (Husked Ear Data)	St. Dev.	Sample Size	Mean	St.Dev.	Sample Size
<u>12.0</u> cm Ear Length	<u>1.79</u>	<u>30</u>	<u>10.2</u>	<u>1.22</u>	<u>30</u>
<u>40.0</u> mm Ear Diameter at mid-point	<u>1.54</u>	<u>30</u>	<u>37.7</u>	<u>1.53</u>	<u>30</u>
<u>80.7</u> gm Ear Weight	<u>18.84</u>	<u>30</u>	<u>67.5</u>	<u>9.96</u>	<u>30</u>
<u>13.5</u> Number of Kernel Rows	<u>1.48</u>	<u>30</u>	<u>12.9</u>	<u>1.14</u>	<u>30</u>
<u>2</u> Kernel Rows: 1=Indistinct, 2=Distinct			<u>2</u>		
<u>2</u> Row Alignment: 1=Straight, 2=Slightly Curved, 3=Spiral			<u>2</u>		
<u>8.1</u> cm Shank Length	<u>1.07</u>	<u>30</u>	<u>10.0</u>	<u>2.73</u>	<u>30</u>
<u>2</u> Ear Taper: 1=Slight cyl., 2=Average slightly con., 3=Extreme conical			<u>2</u>		

8. KERNEL (Dried):	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
<u>10.2</u> mm Kernel Length	<u>0.53</u>	<u>30</u>	<u>9.8</u>	<u>0.53</u>	<u>30</u>
<u>8.8</u> mm Kernel Width	<u>0.70</u>	<u>30</u>	<u>8.0</u>	<u>0.59</u>	<u>30</u>
<u>4.8</u> mm Kernel Thickness	<u>0.68</u>	<u>30</u>	<u>4.5</u>	<u>0.73</u>	<u>30</u>
<u>35.2</u> % Round Kernels (Shape Grade)	<u>10.05</u>	<u>2</u>	<u>20.0</u>	<u>0.90</u>	<u>2</u>
<u>1</u> Aleurone Color Pattern: 1=Homozygous, 2=Segregating (describe)			<u>1</u> (describe)		
<u>7</u> Aleurone Color (Munsell Code) <u>2.5Y812</u>			<u>9</u> Munsell Code <u>2.5YR712</u>		
<u>7</u> Hard Endosperm Color (Munsell Code) <u>10YR814</u>			<u>7</u> Munsell Code <u>10YR712</u>		
<u>3</u> Endosperm Type: 1=Sweet(su1), 2=Extra Sweet(sh2), 3=Normal Starch, 4=High Amylose Starch, 5=Waxy Starch, 6=High Protein, 7=High Lysine, 8=Super Sweet (se), 9=High Oil, 10=Other			<u>3</u> (describe)		
<u>27.9</u> gm Weight per 100 kernels (unsized sample)	<u>1.13</u>	<u>2</u>	<u>24.1</u>	<u>0.00</u>	<u>2</u>

9. COB:	St.Dev.	Sample Size	Mean	St.Dev.	Sample Size
<u>21.5</u> mm Cob Diameter at mid-point	<u>1.66</u>	<u>30</u>	<u>22.2</u>	<u>1.30</u>	<u>30</u>
<u>14</u> Cob Color (Munsell Code) <u>2.5YR38</u>			<u>10</u> Munsell Code <u>10R48</u>		



10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank

if not tested; leave Race or Strain Options blank if polygenic):

## A. Leaf Blights, Wilts, and Local Infection Diseases

- ☐ Anthracnose Leaf Blight (*Colletotrichum graminicola*)  
☐ Common Rust (*Puccinia sorghi*)  
9 Common Smut (*Ustilago maydis*)  
☐ Eyespot (*Kabatiella zeae*)  
☐ Goss's Wilt (*Clavibacter michiganense* spp. *nebraskensis*)  
☐ Gray Leaf Spot (*Cercospora zeae-maydis*)  
☐ Helminthosporium Leaf Spot (*Bipolaris zeicola*) Race \_\_\_\_\_  
☐ Northern Leaf Blight (*Exserohilum turcicum*) Race \_\_\_\_\_  
☐ Southern Leaf Blight (*Bipolaris maydis*) Race \_\_\_\_\_  
☐ Southern Rust (*Puccinia Polysora*)  
☐ Stewart's Wilt (*Erwinia stewartii*)  
☐ Other (Specify) \_\_\_\_\_

## B. Systemic Diseases

- ☐ Corn Lethal Necrosis (MCMV and MDMV)  
☐ Head Smut (*Sphacelotheca reiliana*)  
☐ Maize Chlorotic Dwarf Virus (MCDV)  
☐ Maize Chlorotic Mottle Virus (MCMV)  
☐ Maize Dwarf Mosaic Virus (MDMV) Strain \_\_\_\_\_  
☐ Sorghum Downy Mildew of Corn (*Peronosclerospora sorghi*)  
☐ Other (Specify) \_\_\_\_\_

## C. Stalk Rots

- ☐ Anthracnose Stalk Rot (*Colletotrichum graminicola*)  
☐ Diplodia Stalk Rot (*Stenocarpella maydis*)  
☐ Fusarium Stalk Rot (*Fusarium moniliforme*)  
☐ Gibberella Stalk Rot (*Gibberella zeae*)  
☐ Other (Specify) \_\_\_\_\_

## D. Ear and Kernel Rots

- ☐ Aspergillus Ear and Kernel Rot (*Aspergillus flavus*)  
☐ Diplodia Ear Rot (*Stenocarpella maydis*)  
☐ Fusarium Ear and Kernel Rot (*Fusarium moniliforme*)  
7 Gibberella Ear Rot (*Gibberella zeae*)  
☐ Other (Specify) \_\_\_\_\_

- ☐ Anthracnose Leaf Blight  
☐ Common Rust  
9 Common Smut  
☐ Eyespot  
☐ Goss's Wilt  
☐ Gray Leaf Spot  
☐ Helminthosporium Leaf Spot Race \_\_\_\_\_  
☐ Northern Leaf Blight Race \_\_\_\_\_  
☐ Southern Leaf Blight Race \_\_\_\_\_  
☐ Southern Rust  
☐ Stewart's Wilt  
☐ Other (Specify) \_\_\_\_\_

- ☐ Corn Lethal Necrosis  
☐ Head Smut  
☐ Maize Chlorotic Dwarf Virus  
☐ Maize Chlorotic Mottle Virus  
☐ Maize Dwarf Mosaic Virus Strain \_\_\_\_\_  
☐ Sorghum Downy Mildew of Corn  
☐ Other (Specify) \_\_\_\_\_

- ☐ Anthracnose Stalk Rot  
☐ Diplodia Stalk Rot  
☐ Fusarium Stalk Rot  
☐ Gibberella Stalk Rot  
☐ Other (Specify) \_\_\_\_\_

- ☐ Aspergillus Ear & Kernel Rot  
☐ Diplodia Ear Rot  
☐ Fusarium Ear & Kernel Rot  
5 Gibberella Ear Rot  
☐ Other (Specify) \_\_\_\_\_

Note: Use chart on first page to choose color codes for color traits.

## 11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); Leave blank

if not tested

St. Dev.

Sample Size

St. Dev.

Sample Size

\_ Banks Grass Mite (*Oligonychus pratensis*)

\_ Banks Grass Mite

Corn Earworm (*Helioverpa zea*)

Corn Earworm

\_ Leaf Feeding

\_ Leaf Feeding

Silk Feeding \_ \_ \_ \_ \_ mg larval wt.

\_ Ear Damage

\_ Ear Damage

\_ Corn Leaf Aphid (*Rhopalosiphum maidis*)

\_ Corn Leaf Aphid

\_ Corn Sap Beetle (*Carpophilus dimidiatus*)

\_ Corn Sap Beetle

European Corn Borer (*Ostrinia nubilalis*)

European Corn Borer

1 st Generation (Typically Whorl Leaf Feeding)

1 st Generation

\_ 2 nd Generation (Typically Leaf Sheath-Collar Feeding)

\_ 2 nd Generation

Stalk Tunneling: \_ \_ \_ \_ \_ cm tunneled/plant

Fall Armyworm (*Spodoptera frugiperda*)

Fall Armyworm

\_ Leaf-Feeding

\_ Leaf-Feeding

Silk-Feeding \_ \_ \_ \_ \_ mg larval wt.

\_ Maize Weevil (*Sitophilus zeamais*)

\_ Maize Weevil

\_ Northern Rootworm (*Diabrotica barberi*)

\_ Northern Rootworm

\_ Southern Rootworm (*Diabrotica undecimpunctata*)

\_ Southern Rootworm

Southwestern Corn Borer (*Diatraea grandiosella*)

Southwestern Corn Borer

\_ Leaf Feeding

\_ Leaf Feeding

Stalk Tunneling: \_ \_ \_ \_ \_ cm tunneled/plant

\_ Two-spotted Spider Mite (*Tetranychus urticae*)

\_ Two-spotted Spider Mite

\_ Western Rootworm (*Diabrotica virgifera virgifera*)

\_ Western Rootworm

\_ Other (Specify) \_\_\_\_\_

\_ Other (Specify) \_\_\_\_\_

## 12. AGRONOMIC TRAITS:

4 Stay Green (at 65 days after anthesis) (Rate on scale from 1=worst to 9=excellent)1 Stay Green

% Dropped Ears (at 65 days after anthesis)

% Dropped ears

\_ % Pre-anthesis Brittle Snapping

\_ % Pre-anthesis Brittle Snapping

% Pre-anthesis Root Lodging

% Pre-anthesis Root Lodging

11 % Post-anthesis Root Lodging (at 65 days after anthesis)38 Post-anthesis Root Lodging6,268.0 Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)3,311.0 Yield

## 13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied.)

\_ Isozymes

\_ RFLP's

\_ RAPD's

1 ☒ Other (Specify) SNPs

JMS 7/23/2012

## REFERENCES:

Butler, D.R. 1954. A System for the Classification of Corn Inbred Lines. PhD Thesis, Ohio University.

Emerson, R.A., G.W. Beadle, and A.C. Fraser, 1935. A summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180.

Farr, D.F., G.F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant Products in the United States. The American Phytopathological Society, St. Paul, MN.

Inglett, G.E. (Ed) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Westpoint, CT.

Jugenheimer, R.W. 1976. Corn: Improvement, Seed Production, and Uses. John Wiley &amp; Sons, New York.

McGee, D.C. 1988. Maize Diseases. APS Press, St. Paul, MN. 150 pp.

Munsell Color Chart for Plant Tissues. Macbeth. P.O. Box 230. Newburgh, N.Y. 12551-0230

The Mutants of Maize. 1968. Crop Science Society of America. Madison, WI.

Shurtleff, M.C. 1980. Compendium of Corn Diseases. APS Press, St. Paul, MN. 105 pp.

Sprague, G.F., and J.W. Dudley (Editors). 1988. Corn and Corn Improvement, Third Edition. Agronomy Monograph 18. ASA, CSSA, SSSA, Madison, WI.

Stringfield, G.H. Maize Inbred Lines of Ohio A.E.S., Bul. 831. 1959.

U.S. Department of Agriculture 1936, 1937. Yearbook.

COMMENTS (e. g. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D.)



## CLARIFICATION OF DATA IN EXHIBITS B AND C

Please note the data presented in Exhibit B and C, "Objective Description of Variety," are collected primarily at Johnston and Dallas Center, Iowa. The data in Table 1 are from two sample t-tests using data collected in Johnston and Dallas Center, IA. These traits in Exhibit B collectively show distinct differences between the two varieties.

For any given year of data collection, our experimental design was set up in a typical complete block design commonly used in agricultural corn research experiments with one replication grown at each location. The experiment procedures generally involve two or three locations/environments with different planting dates, planted in 17.42 ft. rows with 2 rows for each variety. Approximately 24-30 plants emerged in each of 2 rows for a total of around 48 to 60 plants being evaluated at each location and 96 to 180 plants across locations. For plant level traits, we sampled up to 15 representative plants from the 2 rows of the 2 row plot (group) of plants at each location. For plot level traits we evaluated the 2 row plot (group) and gave a representative score or average on the 48-60 plants in the group within an experiment.

Month	GROWING DEGREE UNITS (GDUs)		PRECIPITATION (Inches)	
	2007		2007	
	Dallas Center	Johnston	Dallas Center	Johnston
May	420	530	5.17	6.20
June	634	663	3.94	3.61
July	718	777	1.82	2.44
August	747	807	7.41	6.61
September	477	526	2.83	3.68
<b>TOTAL</b>	<b>2996</b>	<b>3303</b>	<b>21.17</b>	<b>22.54</b>

Growing Degree Units use following formula:  $GDU = ((T1+T2)/2)-50$

Where T1 = minimum temperature for a given day with 50 degrees Fahrenheit as the minimum temperature used and 86 degrees Fahrenheit is the maximum temperature used.

Where T2 = maximum temperature for a given day with 86 degrees Fahrenheit as the maximum temperature used and 50 degrees Fahrenheit is the minimum temperature used.

GDUs are calculated each day and accumulated (summed) over certain number of days.



U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

**EXHIBIT E**  
**STATEMENT OF THE BASIS OF OWNERSHIP**

1. NAME OF APPLICANT(S)  <b>Pioneer Hi-Bred International, Inc.</b>	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME  <b>PHPNN</b>
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)  <b>7301 NW 62<sup>nd</sup> Avenue P.O. Box 85 Johnston, IA 50131-0085</b>	5. TELEPHONE (Include area code)  <b>(515) 270-4051</b>	6. FAX (Include area code)  <b>(515) 253-2125</b>
7. PVPO NUMBER		<b>#200800241</b>

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☒ YES ☐ NO10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☒ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

Pioneer Hi-Bred International, Inc. (PHI), Des Moines, Iowa, and/or its wholly owned subsidiary Pioneer Overseas Corporation (POC), Des Moines, Iowa, is the employer of the plant breeders involved in the selection and development of PHPNN. Pioneer Hi-Bred International and/or Pioneer Overseas Corporation has the sole rights and ownership of PHPNN pursuant to written contracts that assign all rights in the variety to PHI and/or POC at the time such variety was created. No rights to this variety are retained by any individuals.

**PLEASE NOTE:**

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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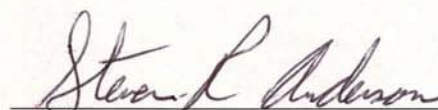
To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

**U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MD 20705**

**EXHIBIT F  
DECLARATION REGARDING DEPOSIT**

NAME OF OWNER (S)  <b>Pioneer Hi-Bred International, Inc.</b>	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country)  <b>7301 NW 62<sup>nd</sup> Avenue Johnston, IA 50131-0085</b>	TEMPORARY OR EXPERIMENTAL DESIGNATION  VARIETY NAME <b>PHPNN</b>
NAME OF OWNER REPRESENTATIVE (S)  <b>Steven R. Anderson</b>	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country)  <b>7301 NW 62<sup>nd</sup> Avenue Johnston, IA 50131-0085</b>	FOR OFFICIAL USE ONLY  PVPO NUMBER <b>#200800241</b>

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

  
Signature

4-24-2008  
Date